

Claims:

1. A harrow frame for supporting a harrow ground working tool, the harrow frame comprising: a hitch, a center unit, a right tool support arm being elongate and having a secured end and an outboard end, a left tool support arm being elongate and having a secured end and an outboard end, the left tool support arm and the right tool support arm each acting as levers each with a fulcrum adjacent their secured ends through which they engage the center unit, a drive system acting adjacent the secured ends of the tool support arms to pivot the left tool support arm and the right tool support arm about their fulcrums to move them between a first relative angle and a second relative angle and a lock to releasably lock the left tool support arm and the right tool support arm into the first relative angle and the second relative angle, the drive and the lock being controllable remotely such that the left tool support arm and the right tool support arm can be pivoted about their fulcrums while the harrow frame is being moved along a ground surface.
5
2. The harrow frame of claim 1 wherein the left and right tool support arms are locked and driven substantially exclusively through connections adjacent their secured ends.
10
3. The harrow frame of claim 2 wherein the connections are provided between the tool support arm secured ends and the tool support arm fulcrums.
15
4. The harrow frame of claim 1 wherein the lock is selected to act without relying on the use of tension chains connected to the tool support arms between the fulcrum and the outboard end.
20
- 25

5. The harrow frame of claim 1 wherein the drive system is selected to act without manual adjustment of any components on the frame during operation of the drive system.
6. The harrow frame of claim 1 wherein the first relative angle is a first selected angle of aggression and the second relative angle is a second selected angle of aggression.
7. The harrow frame of claim 1 wherein the first relative angle is an open position for use and the second relative angle is a folded position.
8. The harrow frame of claim 7 wherein in the folded position, the relative angle between the left tool support arm and the right tool support arm is such that the width defined between the outer limits of the left tool support arm and the right tool support arm is less than 8.5 feet.
9. The harrow frame of claim 7 wherein the drive system is positioned such that it is substantially outside of an area in which the tool support arms are positioned in the folded position.
10. The harrow frame of claim 1 wherein the drive system is positioned between the towing end and the center unit and the tool support arms fold away from the towing end behind the center unit.
11. The harrow frame of claim 1 wherein the drive system includes a hydraulic cylinder connected the left tool support arm and the right tool support arm such that any input drive of the drive system is conveyed substantially simultaneously to the tool support arms.
12. The harrow frame of claim 1 wherein the lock is incorporated into the drive system by use of a locking hydraulic cylinder.
13. The harrow frame of claim 1 wherein the fulcrums are mounted in a fixed position on the center unit.

14. The harrow frame of claim 1 wherein the lock acts adjacent the secured end to lock the left tool support arm and the right tool support arm into the open position for use.
15. The harrow frame of claim 1 further comprising a wheel positioned to support the center unit, the wheel fixed substantially against pivoting about a vertical axis.
16. The harrow frame of claim 1 further comprising a trailing unit for supporting a tail harrow ground working portion, the trailing unit having an outboard end and a secured end.
- 10 17. The harrow frame of claim 16 further comprising a lift mechanism to raise the outboard end of the trailing unit upwardly to permit the left tool support arm and the right tool support arm to be folded under the trailing unit.
- 15 18. The harrow frame of claim 7 further comprising a trailing unit for supporting a tail harrow ground working portion, the trailing unit having an outboard end and a secured end and a lift mechanism to raise the outboard end of the trailing unit upwardly during a folding operation to permit the left tool support arm and the right tool support arm to be folded under the trailing unit.
- 20 19. The harrow frame of claim 18 further comprising a safety lock selected to prevent the left and right tool support arms from being moved into the folded configuration without the trailing unit first being raised upwardly.
- 25 20. The harrow frame of claim 18 further comprising a safety lock selected to lock the right tool support arm and the left tool support arm together in the folded configuration by setting the trailing unit down on the tool support arms when they are folded under the trailing unit.

21. A method for operating a harrow comprising: providing a harrow including a center unit, a right tool support arm including a ground working tool secured thereto, a left tool support arm including a ground working tool secured thereto, and a drive system operable to pivot the right tool support arm and the left tool support arm relative to the center unit, operating the drive system to pivot the right tool support arm and the left tool support arm into a first operational position at a first angle of aggression; working a field with the harrow in the first operational position; remotely operating the drive system to pivot and lock the right tool support arm and the left tool support arm into a second operational position at a second angle of aggression different from the first angle of aggression; and working a field with the harrow in the second operational position.
22. The method of claim 21 wherein the step of remotely operating is carried out while the harrow is moving.
23. The method of claim 21 wherein the step of remotely operating is carried out while the harrow continues to be operated to work a field.
24. The method of claim 21 wherein after working the field in the second operational position, the harrow is folded by the drive system.
25. The method of claim 21 wherein the drive system includes a locking hydraulic cylinder for pivoting and locking the right tool support arm and the left tool support arm into a second operational position.
26. The method of claim 21 wherein during the step of operating the drive system to pivot the right tool support arm and the left tool support arm into a first operational position a drive rod of the drive system engages an end of each of the right tool support arm and the left tool support arm and drives them each about fulcrums securing the right tool support arm and the left tool support arm to the center unit until the drive rod is stopped and

locked at a stroke length intermediate a maximum and a minimum stroke length for the drive rod.

27. The method of claim 21 wherein the first angle of aggression and the second angle of aggression are each selected from angles of 25° to 45° , relative to an orthogonal axis to a long center axis of the harrow..